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Wallace et al.

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[54] VASO-OCCCLUSIVE COIL WITH CONICAL END

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[56] References Cited

U.S. PATENT DOCUMENTS

3,174,851	3/1965	Buehler et al.
3,351,463	11/1967	Rozner et al.
3,753,700	8/1973	Harrison et al.
4,994,069	2/1991	Ritchart et al.
5,108,407	4/1992	Geremia et al.
5,122,136	6/1992	Guglielmi et al.
5,234,437	8/1993	Sepetka et al.
5,250,071	10/1993	Palermo
5,261,916	11/1993	Engelson
5,304,194	4/1994	Chee et al.

5,304,195	4/1994	Twyford, Jr. et al.
5,312,415	5/1994	Palermo
5,334,210	8/1994	Gianturco
5,350,397	9/1994	Palermo et al.
5,354,295	10/1994	Guglielmi et al.
5,382,259	1/1995	Phelps et al.
5,413,586	5/1995	Dibie et al.
5,514,176	5/1996	Bosley, Jr.
5,522,836	6/1996	Palermo
5,536,274	7/1996	Neuss
5,556,413	9/1996	Lam

FOREIGN PATENT DOCUMENTS

3203410 11/1982 Germany

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[57] ABSTRACT

This is an implantable vaso-occlusive coil which is implanted using minimally invasive surgical techniques. It is a complex, helically wound coil made up of a primary helically wound coil which is then wound into a specific secondary shape. The secondary shape is itself a series of helical turns. At least a portion of the turns in the secondary shape form a cylindrical region and adjacent that region on at least one end is a conical region which tapers from a diameter approximating that of the central cylindrical region to a smaller diameter. The device is desirably self-forming upon exit from the distal end of a delivery catheter. Also, the conical tipped vaso-occlusive device may also utilize thrombus-enhancing filamentary material.

15 Claims, 3 Drawing Sheets

